

Claims:

1. A network device, comprising:
 - a central switch fabric subsystem; and
 - a distributed switch fabric subsystem coupled to the central switch fabric subsystem and capable of transferring network data with the central switch fabric subsystem.
2. The network device of claim 1, wherein the distributed switch fabric subsystem is located on a line card.
3. The network device of claim 2, wherein the line card is a forwarding card.
4. The network device of claim 1, wherein the central switch fabric subsystem is located on at least one switch fabric card.
5. The network device of claim 1, wherein the central switch fabric subsystem comprises:
 - a controller subsystem located on a first switch fabric card; and
 - a central data transfer subsystem coupled with the controller subsystem, wherein a portion of the central data transfer subsystem is located on a second switch fabric card.
6. The network device of claim 5, wherein another portion of the central data transfer subsystem is located on a third switch fabric card.
7. The network device of claim 1, wherein the distributed switch fabric subsystem comprises:
 - a distributed data transfer subsystem; and
 - a distributed controller subsystem coupled with the distributed data transfer subsystem for controlling network data transfer through the distributed data transfer subsystem.

8. The network device of claim 7, wherein the distributed switch fabric subsystem further comprises:
a local timing subsystem coupled with the distributed data transfer subsystem and the distributed controller subsystem.
9. The network device of claim 7, wherein the distributed data transfer subsystem comprises a data slice component.
10. The network device of claim 7, wherein the distributed controller subsystem comprises an enhanced port processor component.
11. The network device of claim 1, further comprising:
a distributed switch fabric subsystem interface coupled with the distributed switch fabric subsystem and capable of transferring network data with the distributed switch fabric subsystem.
12. The network device of claim 1, wherein the distributed switch fabric subsystem is a first distributed switch fabric subsystem and further comprising:
a second distributed switch fabric subsystem coupled to the central switch fabric subsystem and capable of transferring network data with the central switch fabric subsystem and the first distributed switch fabric subsystem.
13. The network device of claim 1, wherein the central switch fabric subsystem comprises:
a central controller subsystem coupled with the distributed switch fabric subsystem; and
a central data transfer subsystem coupled with the central controller subsystem and the distributed switch fabric subsystem for transferring network data with the distributed switch fabric subsystem.

14. The network device of claim 13, wherein the central switch fabric subsystem further comprises:
a local timing subsystem coupled with the central controller subsystem.
15. The network device of claim 13, wherein the central switch fabric subsystem further comprises:
a local timing subsystem coupled with the central data transfer subsystem.
16. The network device of claim 12, wherein the central controller subsystem comprises a scheduler component.
17. The network device of claim 12, wherein the central data transfer subsystem comprises a cross-bar component.
18. The network device of claim 1, wherein the central switch fabric subsystem includes at least one local timing subsystem and wherein the distributed switch fabric subsystem includes at least one local timing subsystem and further comprising:
a central timing subsystem coupled to the local timing subsystems.
19. The network device of claim 18, wherein the central timing subsystem is located within the central switch fabric subsystem.
20. A network device, comprising:
a central switch fabric subsystem; and
a plurality of distributed switch fabric subsystems coupled to the central switch fabric subsystem, wherein each of the plurality of distributed switch fabric subsystems is capable of transferring network data with each of the plurality of distributed switch fabric subsystems through the central switch fabric subsystem.

21. The network device of claim 20, wherein the central switch fabric subsystem is a first central switch fabric subsystem and further comprising:
a second central switch fabric subsystem coupled with the plurality of distributed switch fabric subsystems, wherein each of the plurality of distributed switch fabric subsystems is capable of transferring network data with each of the plurality of distributed switch fabric subsystems through the central switch fabric subsystem.
22. The network device of claim 21, wherein one of the first and second central switch fabric subsystems comprises a primary central switch fabric subsystem and the other of the first and second central switch fabric subsystems comprises a redundant central switch fabric subsystem.
23. The network device of claim 21, wherein certain ones of the plurality of distributed switch fabric subsystems comprise primary distributed switch fabric subsystems and certain others of the plurality of distributed switch fabric subsystems comprise redundant distributed switch fabric subsystems.
24. The network device of claim 23, wherein at least a portion of the plurality of distributed switch fabric subsystems provide a 1:N redundancy scheme.
25. A network device, comprising:
a plurality of switch fabric cards comprising a central switch fabric subsystem;
and
a forwarding card coupled with the switch fabric cards and comprising a switch fabric interface and a distributed switch fabric subsystem.
26. The network device of claim 25, wherein the distributed switch fabric subsystem comprises:
a data slice subsystem for transferring network data with the central switch fabric subsystem.

27. The network device of claim 26, wherein the data slice subsystem comprises:
a plurality of data slice components for transferring network data with the central switch fabric subsystem.
28. The network device of claim 27, wherein the distributed switch fabric subsystem further comprises:
a controller subsystem connected to the data slice subsystem for controlling which network data the data slice subsystem transfers.
29. The network device of claim 27, wherein the distributed switch fabric subsystem further comprises:
a local timing subsystem coupled with the controller subsystem and the data slice subsystem.
30. The network device of claim 25, wherein the switch fabric interface comprises a switch fabric interface component.
31. The network device of claim 25, wherein the central switch fabric subsystem comprises:
a scheduler coupled with the distributed switch fabric subsystem for scheduling network data transfers.
32. The network device of claim 25, wherein the central switch fabric subsystem includes at least one local timing subsystem and wherein the distributed switch fabric subsystem includes at least one local timing subsystem and further comprising:
a central timing subsystem coupled to the local timing subsystems.
33. A network device, comprising:
a plurality of switch fabric cards comprising a central switch fabric subsystem and at least one local timing subsystem; and

a forwarding card coupled with the switch fabric cards and comprising:

- a switch fabric interface;
- a data slice subsystem coupled with the switch fabric interface and at least a portion of the switch fabric cards for transferring network data with the central switch fabric subsystem;
- a data slice controller coupled with the data slice subsystem and at least a portion of the switch fabric cards for controlling network data transfer by the data slice subsystem; and
- a local timing subsystem coupled with the data slice subsystem and the data slice controller; and
- a central timing subsystem coupled with the at least one local timing subsystem within the central switch fabric subsystem and with the local timing subsystem on the forwarding card.

34. A method of operating a network device, comprising:

- switching network data through a central switch fabric subsystem and a plurality of distributed switch fabric subsystems, wherein at least one of the distributed switch fabric subsystems comprises a primary distributed switch fabric subsystem and at least another one of the distributed switch fabric subsystems comprises a redundant distributed switch fabric subsystem;
- removing the primary distributed switch fabric subsystem from the network device during network device operation; and
- switching over to the redundant distributed switch fabric subsystem.

35. The method of claim 34, wherein the central switch fabric subsystem is a first central switch fabric subsystem and further comprising:

- switching network data through a second central switch fabric subsystem and the plurality of distributed switch fabric subsystems;
- removing one of the first and second central switch fabric subsystems from the network device during network device operation; and

switching over to the other of the first and second central switch fabric subsystems.

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